**RISH CON - V / RISH CON - I**

**VOLTAGE / CURRENT TRANSDUCER**

**Application:**

The RISH CON - V / RISH CON - I is used to measure and convert AC Voltage or Current input into a load independent DC current or voltage output signal. Output signal generated is proportional to the root mean square value of the input Current or Voltage.

**Salient Features:**

- True RMS measurement.
- Fully **onsite programmable** input voltage range (for RISH CON - V) & Input current range (for RISH CON - I).
- Available in **Single or Dual output type**.
- **Onsite selectable output type** (DC current / DC voltage).
- **Accuracy class 0.2 (IEC/ EN 60 688)**.
- Seven Segment LCD Display.
- **Rs485(Modbus) Communication**.
- **Wide Auxiliary power supply**. Accept any input between 60-300VAC/DC or 24-60VAC/DC.
- **Output Response Time < 400 ms**.
- Fast and easy installation on DIN RAIL or onto a wall or in a panel using optional screw hole bracket.
- **Connection Terminal : Conventional Screw type**.

**Display Module(Optional):**

Optional 7 segment LCD display with backlit & keypad. For displaying measured parameters & onsite configuration of Input/output.

**RS485 Communication(Optional):**

Optional RS485 communication is available. For reading measured parameters & onsite configuration of input/output.

**Product Features:**

**Measuring Input:**

AC Voltage/ Current input signal, sine wave or distorted wave form.

**Analog Output (Single or dual):**

Isolated analog output which can be set onsite to either voltage or current output.

**Accuracy:**

Output signal accuracy **class 0.2** as per International Standard **IEC/EN 60 688**.

**Programmable Input/Output:**

The Transducer can be programmed onsite using front key & display or through programming port (COM) or through RS 485.

**LED Indication:**

LED indication for power on and output type. (Current output : Red LED, Voltage output : Green LED)

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**Symbols and their meaning:**

- **X** Input AC Voltage / AC Current
- **X0** Start value of input
- **X1** Elbow value of input
- **X2** End value of input
- **Y** Output DC Voltage / DC Current
- **Y0** Start value of output DC Voltage / DC Current
- **Y1** Elbow value of output DC Voltage / DC Current
- **Y2** End value of output DC Voltage / DC Current
- **Rn** Rated value of output burden
- **Fn** Nominal Frequency
## Technical Specifications:

**Measuring Input X**

**Voltage Transducer (RISH CON - V):**
- Nominal input Voltage $U_N$ (AC RMS): $57V \leq U_N \leq 500V$
- PT Primary range: 57V to 400 kV
- Nominal Frequency $F_N$: 45....66 Hz
- Nominal input Voltage burden: $< 0.6 VA$ at $U_N$
- Overload Capacity: $1.2 \times U_N$ continuously,
  $2 \times U_N$ for 1 second, repeated 10 times at 10 minute intervals
  (Maximum 300V with power supply powered from measuring input).

No need of external potentiometer. User can set full scale output for desired input with the help of programmable PT secondary.

**Current Transducer (RISH CON - I):**
- Nominal input Current $I_N$ (AC RMS): $1A \leq I_N \leq 5A$
- CT Primary range: 1 A to 9999 A
- Nominal Frequency $F_N$: 45....66 Hz
- Nominal input Current burden: $< 0.2 VA$ at $I_N$
- Overload Capacity: $1.2 \times I_N$ continuously,
  $10 \times I_N$ for 3 second, repeated 5 times at 5 minute intervals.
  $50 \times I_N$ for 1 second, repeated 1 time at 1 hour interval (max 250 A).

No need of external potentiometer. User can set full scale output for desired input with the help of programmable CT secondary.

**Measuring Output Y (Single or Optional Dual)**

<table>
<thead>
<tr>
<th>Output type</th>
<th>Load independent DC Voltage or DC Current</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(Onsite selectable through DIP switches &amp; programming.)</td>
</tr>
</tbody>
</table>

**Load independent DC output (Y):**
- $0...20mA / 4...20mA OR 0...10V.$

**Output burden with DC current output Signal:**
- $0 \leq R \leq 15V/Y2$

**Output burden with DC voltage output Signal:**
- $Y2/(2 mA) \leq R \leq \infty$

**Current limit under overload $R=0$:**
- $\leq 1.25 \times Y2$ with current output
- $\leq 100 mA$ with voltage output

**Voltage limit under $R=\infty$:**
- $< 1.25 \times Y2$ with voltage output
- $\leq 30 V$ with current output

**Residual Ripple in Output signal:**
- $\leq 1\%$ pk-pk

**Response Time:**
- $< 400 ms.$

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Subject to change without Notice
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Auxiliary Power Supply:
AC/DC Auxiliary Supply 60V... 300 VAC-DC ± 5% or 24... 60 VAC-DC ± 10%
AC Auxiliary supply frequency range 40 to 65 Hz
Auxiliary supply consumption

<table>
<thead>
<tr>
<th>Auxiliary supply voltage</th>
<th>Single output</th>
<th>Dual output</th>
</tr>
</thead>
<tbody>
<tr>
<td>60V...300 VAC-DC</td>
<td>≤ 8VA</td>
<td>≤ 10VA</td>
</tr>
<tr>
<td>24V...60 VAC-DC</td>
<td>≤ 6 VA</td>
<td>≤ 9 VA</td>
</tr>
</tbody>
</table>

Accuracy (Acc. to IEC / EN 60688)
Reference Value Output end Value Y2 (Voltage or Current)
Basic Accuracy 0.2 * C
Factor C (The highest value applies if calculated C is less than 1, then C=1 applies)

Linear characteristics:
\[
C = \frac{Y2 - Y0}{X2 - X0}
\]
For \(X0 \leq X \leq X1\)
\[
C = \frac{Y1 - Y0}{X1 - X0}
\]
or \(C = 1\)

Bent characteristics:
\[
C = \frac{Y1 - Y2}{X1 - X2}
\]
For \(X1 \leq X \leq X2\)
\[
C = \frac{1}{X2}
\]
or \(C = 1\)

Reference conditions for Accuracy:
Ambient temperature 23°C +/- 1°C
Pre-conditioning 30 min acc. to IEC / EN 60 688
Input Variable Rated Voltage / Rated Current
Input waveform Sinusoidal, Form Factor 1.1107
Input signal frequency 50 or 60Hz
Auxiliary supply voltage At nominal range
Output Load \(Rn = 7.5 \text{ V} / Y2 \pm 1\%\) With DC current output signal
\(Rn = Y2 / 1 \text{ mA} \pm 1\%\) With DC voltage output signal
Miscellaneous Acc. to IEC / EN 60 688

Additional Error:
Temperature influence ± 0.2% / 10°C

Influence of Variations:
As per IEC / EN 60688 standard.
Output stability < 30min

Output Characteristics:
X0 = Start value of input
X1 = Elbow value of input
X2 = End value of input
Y0 = Start value of output
Y1 = Elbow value of output
Y2 = End value of output

Note: End value (Y2) of output cannot be changed onsite.
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Safety:

Protection Class
II (Protection Isolated, EN 61 010)
Protection
IP 40, housing according to EN 60 529
IP 20, terminal according to EN 60 529
Pollution degree
2
Installation Category
III
Insulation Voltage
1min. (EN 61 010-1)
7700V DC, Input versus outer surface
5200V DC, Input versus all other circuits
5200V DC, Auxiliary supply versus outer surface and output
690V DC, Output versus output versus each other versus outer surface.

Installation Data:

Mechanical Housing
Lexan 940 (polycarbonate)
Flammability Class V-0 acc. To UL 94, self extinguishing,
non dripping, free of halogen
Mounting position
Rail mounting / wall mounting
Weight
Approx. 0.4kg
Connection Terminal
Connection Element
Conventional Screw type terminal with indirect wire pressure
Permissible cross section
≤ 4.0 mm² single wire or 2 x 2.5 mm² fine wire

Environmental:

Nominal range of use
0 °C...23 °C...45 °C (usage Group II)
Storage temperature
-40 °C to 70 °C
Relative humidity of annual mean
≤ 75%
Altitude
2000m max

Ambient tests:

EN 60 068-2-6
Vibration
± 2 g
Acceleration
Frequency range
10...150...10Hz, rate of frequency sweep: 1 octave/minute
Number of cycles
10, in each of the three axes
EN 60 068-2-7
Shock
EN 60 068-2-1/-2/-3
Acceleration
3 x 50g
3 shocks in each direction
Cold, Dry, Damp heat
IEC 61000-4-2/-3/-4/-5/-6
EN 55 011
Electromagnetic compatibility.
LED Indication:

<table>
<thead>
<tr>
<th>O/P</th>
<th>LED</th>
<th>Description</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ON</td>
<td>Aux.supply healthy condition</td>
<td>Green LED</td>
</tr>
<tr>
<td>O/P1</td>
<td>LED</td>
<td>Output1 voltage selection</td>
<td>Green LED</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Output1 Current selection</td>
<td>Red LED</td>
</tr>
<tr>
<td>O/P2</td>
<td>LED</td>
<td>Output2 voltage selection</td>
<td>Green LED</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Output2 Current selection</td>
<td>Red LED</td>
</tr>
</tbody>
</table>

Electrical Connections:

- Measuring input: ~, ~, +, -
- Auxiliary Power supply: ~, +, ~, -
- Measuring output - 1: +, -
- Measuring output - 2: +, -

Dimensions:

- Width: 106.5 mm
- Height: 99.5 mm
- Depth: 43.75 mm

Fig 2.

Fig 3.
Programming (Figs. 4 and 5)

Programming of transducer can be done in three ways:

1) Programming Via Front LCD & two keys.
2) Programming Via optional RS485(MODBUS) communication port. (Device address, PT Ratio, CT Ratio, Password, communication parameter, Output Type & simulation mode can be programmed).
3) Programming Via Programming port available at front of RISH CON Transducers using optional PRKAB601 Adapter.

Programming Via Programming port (COM)

A PC with RS 232 C interface along with the programming cable PRKAB 601 and the configuration software are required to Program the transducer.

The connections between
PC ↔ PRKAB 601 ↔ Rish CON Transducer.

The power supply must be applied to Transducer before it can be programmed.

The Configuration software is supplied on a CD. The programming cable PRKAB601 adjusts the signal level and provides the electrical insulation between the PC and RISH CON Transducers.

Configuring Rish Con Transducer:

To configure RISH CON Transducer Input / output one of the three programming methods can be adapted along with mechanical switch setting (DIP switch setting on PCB).

DIP Switch Setting for OUTPUT:

Type of output (current or voltage signal) has to be set by DIP switch (see Fig.5).

For programming of DIP switch the user needs to open the transducer housing & set the DIP switch located on PCB to the desired output type Voltage or Current. Output range changing is not possible with DIP switch setting.

Refer below Fig. 5 for DIP switch setting.

The four pole DIP switch is located on the PCB in the RISH CON Transducer.

<table>
<thead>
<tr>
<th>DIP Switch Setting</th>
<th>Type of Output Signal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1234 ON</td>
<td>load-independent current</td>
</tr>
<tr>
<td>1234 ON</td>
<td>load-independent voltage</td>
</tr>
</tbody>
</table>

Fig. 5
RISH CON - V / RISH CON - I
VOLTAGE / CURRENT TRANSDUCER

Ordering Information: Standard Version:

Dual Output:   RISH CON - V (500V) - F - H - O1A1 - O2V1 - D - Z - Z
               RISH CON - I (5A) - F - L - O1A1 - O2V1 - D - Z - Z

Single Output: RISH CON - V (500V) - F - H - O1A1 - D - Z - Z
               RISH CON - I (5A) - F - L - O1A1 - D - Z - Z

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Transducer parameter</th>
<th>Ordering Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input Signal</td>
<td>RISH CON - V (500V)</td>
</tr>
<tr>
<td></td>
<td>Voltage (Range: 57V to 500V)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Current (Range: 1A to 5A)</td>
<td>RISH CON - I (5A)</td>
</tr>
<tr>
<td></td>
<td>Note: Input Ranges are onsite programmable.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Frequency of Input (50 Hz / 60 Hz)</td>
<td>F</td>
</tr>
<tr>
<td>3</td>
<td>Auxiliary Supply</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Aux (60V.....300VAC-DC)</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>Low Aux (24V.....60VAC-DC)</td>
<td>L</td>
</tr>
<tr>
<td>4</td>
<td>Output 1 (Standard Ranges)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Current = 0.....20 mA</td>
<td>O1A1</td>
</tr>
<tr>
<td>5</td>
<td>Output 2 (Standard Ranges)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Voltage = 0.....10 V</td>
<td>O2V1</td>
</tr>
<tr>
<td>6</td>
<td>With Display</td>
<td>D</td>
</tr>
<tr>
<td>7</td>
<td>Without RS-485</td>
<td>Z</td>
</tr>
<tr>
<td>8</td>
<td>Without PRKAB 601</td>
<td>Z</td>
</tr>
</tbody>
</table>

Note: End value of output can not be changed onsite.
### Ordering Information:

#### Optional Versions:

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Transducer parameter</th>
<th>Ordering Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Input Signal</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Voltage (Range: 57V to 500V)</td>
<td>RISH CON - V (User specified: XXXV)</td>
</tr>
<tr>
<td></td>
<td>Current (Range: 1A to 5A)</td>
<td>RISH CON - I (User specified: XA)</td>
</tr>
<tr>
<td>Note</td>
<td>Input Ranges are onsite programmable.</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Frequency of Input (50 Hz / 60 Hz)</td>
<td>F</td>
</tr>
<tr>
<td>3</td>
<td>Auxiliary Supply</td>
<td></td>
</tr>
<tr>
<td></td>
<td>High Aux (60V...300VAC-DC)</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>Low Aux (24V...60VAC-DC)</td>
<td>L</td>
</tr>
<tr>
<td>4</td>
<td>Output 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Current = 0...20 mA</td>
<td>O1A1</td>
</tr>
<tr>
<td></td>
<td>Current = 4...20 mA</td>
<td>O1A2</td>
</tr>
<tr>
<td></td>
<td>Voltage = 0...10 V</td>
<td>O1V1</td>
</tr>
<tr>
<td></td>
<td>Optional factory set ranges</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Current = 0...10 mA</td>
<td>O1A3</td>
</tr>
<tr>
<td></td>
<td>Current = 0...5 mA</td>
<td>O1A4</td>
</tr>
<tr>
<td></td>
<td>Current = 0...2.5 mA</td>
<td>O1A5</td>
</tr>
<tr>
<td></td>
<td>Current = 0...1 mA</td>
<td>O1A6</td>
</tr>
<tr>
<td></td>
<td>Voltage = 0...5 V</td>
<td>O1V2</td>
</tr>
<tr>
<td></td>
<td>Voltage = 0...2.5 V</td>
<td>O1V3</td>
</tr>
<tr>
<td></td>
<td>Voltage = 0...1 V</td>
<td>O1V4</td>
</tr>
<tr>
<td>5</td>
<td>Output 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Without output 2</td>
<td>O200</td>
</tr>
<tr>
<td></td>
<td>Current = 0...20 mA</td>
<td>O2A1</td>
</tr>
<tr>
<td></td>
<td>Current = 4...20 mA</td>
<td>O2A2</td>
</tr>
<tr>
<td></td>
<td>Voltage = 0...10 V</td>
<td>O2V1</td>
</tr>
<tr>
<td></td>
<td>Optional factory set ranges</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Current = 0...10 mA</td>
<td>O2A3</td>
</tr>
<tr>
<td></td>
<td>Current = 0...5 mA</td>
<td>O2A4</td>
</tr>
<tr>
<td></td>
<td>Current = 0...2.5 mA</td>
<td>O2A5</td>
</tr>
<tr>
<td></td>
<td>Current = 0...1 mA</td>
<td>O2A6</td>
</tr>
<tr>
<td></td>
<td>Voltage = 0...5 V</td>
<td>O2V2</td>
</tr>
<tr>
<td></td>
<td>Voltage = 0...2.5 V</td>
<td>O2V3</td>
</tr>
<tr>
<td></td>
<td>Voltage = 0...1 V</td>
<td>O2V4</td>
</tr>
<tr>
<td>6</td>
<td>LCD display module</td>
<td></td>
</tr>
<tr>
<td></td>
<td>With Display</td>
<td>D</td>
</tr>
<tr>
<td></td>
<td>Without Display</td>
<td>Z</td>
</tr>
<tr>
<td>7</td>
<td>RS-485 module</td>
<td></td>
</tr>
<tr>
<td></td>
<td>With RS-485</td>
<td>R</td>
</tr>
<tr>
<td></td>
<td>Without RS-485</td>
<td>Z</td>
</tr>
<tr>
<td>8</td>
<td>PRKAB 601 module</td>
<td></td>
</tr>
<tr>
<td></td>
<td>With PRKAB 601</td>
<td>PR</td>
</tr>
<tr>
<td></td>
<td>Without PRKAB 601</td>
<td>Z</td>
</tr>
</tbody>
</table>

**Optional Version Example:**

**RISH CON-I - XA - F - H - O1A1 - O1V1 - O2V1 - O2A1 - D - R - PR**

RISH CON-I is current transducer, XA, 50/60 Hz nominal input signal, High Aux, Output1 = 0...20mA or 0...10V, Output2 = 0...10V or 0...20mA, with LCD display module, with RS-485 & with PRKAB 601 cable.

**RISH CON-V - XXXV - F - L - O1A1 - O1V1 - O2V1 - O2A1 - Z - R - Z**

RISH CON-V is Voltage transducer, XXXV, 50/60 Hz nominal input signal, Low Aux, Output1 = 0...20mA or 0...10V, Output2 = 0...10V or 0...20mA, Without LCD display module, with RS-485 & without PRKAB 601 cable.

**Note:** End value of output can not be changed onsite.